



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

New Baccalaureate Degree Minor

UNIVERSITY:	SDSU
TITLE OF PROPOSED MINOR:	Sustainability
DEGREE(S) IN WHICH MINOR MAY BE EARNED:	Any
EXISTING RELATED MAJORS OR MINORS:	Conservation Planning & Park Management (B.S.), Geography (Minor & B.S.), Ecology & Environmental Sciences (B.S.), Rangeland Ecology & Management (Minor & B.S.), Sustainable Energy Systems (Minor)
INTENDED DATE OF IMPLEMENTATION:	2018-2019 Academic Year
PROPOSED CIP CODE:	30.3301
UNIVERSITY DEPARTMENT:	Geography
UNIVERSITY DIVISION:	Arts, Humanities and Social Sciences

University Approval

To the Board of Regents and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

Barry H. Dunn

President of the University

5/16/2018

Date

- 1. Do you have a major in this field?** Yes No
- 2. If you do not have a major in this field, explain how the proposed minor relates to your university mission.**

South Dakota State University (SDSU) requests authorization to offer a baccalaureate minor in Sustainability. The proposed Sustainability minor will prepare graduates to help their employers conserve resources (from energy to water to dollars) and improve efficiency; create new, more environmentally and socially responsible technologies or services; educate stakeholders about environmental and social issues and engage them in planning and programming accordingly, and more. Regardless of job title, the work of all sustainability professionals focuses on the intersection of environment, economics and social and cultural issues: what's referred to in the business world as the "triple bottom line" of people, profits and planet. The minor complements any major on

campus and provides both intellectual breadth and depth in a challenging new area of inquiry that is gaining a high level of interest in businesses, government agencies, and non-governmental organizations. A minor in Sustainability and a major in a discipline will provide excellent thinking and problem-solving skills for students as a citizen, employee, or graduate student.

The proposed minor has been developed through an interdisciplinary collaboration between the Departments of Consumer Sciences, Geography, Natural Resource Management, Chemistry & Biochemistry, and Health Sciences. The minor is interdisciplinary in nature, but it will be administratively aligned with the Department of Geography. The Department of Geography at SDSU is the “best fit” for a Sustainability minor because geography is a discipline that intersects the natural, social, and technological sciences, which means that it has tools and ideas that can be applied to today’s complex problems. For these reasons, geographers are comfortable working with scientists in other disciplines. Sustainability majors, minors, and specializations are offered by many Geography Departments throughout the United States because of geography’s spatial and multidisciplinary approach.

This minor supports the statutory mission of SDSU as provided in SDCL 13-58-1: *Designated as South Dakota’s land grant university, South Dakota State University, formerly the state college of agriculture and mechanical arts, shall be under the control of the Board of Regents and shall provide undergraduate and graduate programs of instruction in the liberal arts and sciences and professional education in agriculture, education, engineering, home economics, nursing, and pharmacy, and other courses or programs as the Board of Regents may determine.*

The Sustainability minor also directly supports SDSU’s most recent strategic plan. IMPACT 2018 identifies as two of the University’s core values the “improved quality of life for the people and communities of South Dakota, the nation and the world” and “economic and environmental sustainability.” Strategic Goal 1 commits the University to “prepare students to make intellectual contributions to the global community” and “cultivate aware, engaged and active citizens well prepared to work in local, state, national and global communities.”

SDSU does not intend to request new state resources; however, many of the courses within the minor have existing prefix fees attached to them.

3. What is the nature/purpose of the proposed minor?

Sustainability is a concept that is becoming increasingly used as human societies recognize the finite nature of many natural resources and the lingering ill effects of overconsumption, pollution, and poorly planned land uses. Sustainability is defined as meeting the needs of the current generation without compromising the ability of future generations to meet their own needs, and to do so while maintaining ecological processes, functions, biodiversity, and productivity into the future. An understanding of sustainability includes the scientific basis for sustainable resource use as well as the social and economic implications and/or costs of sustainable practices. Given the state of the global economy, the heavy reliance of both developed and developing nations on increasingly limited supplies of non-renewable energy sources, and the resultant social unrest that is building throughout many parts of the world, understanding the challenges facing society today requires an interdisciplinary perspective of the problems faced in moving toward a sustainable future.

4. How will the proposed minor benefit students?

The Sustainability minor will allow students to explore the challenges of sustainability and to think about how to develop solutions to pressing issues at the local, regional, and global scale. It introduces students to the concepts, principles, and issues that inform the sustainability paradigm and also integrates classroom and community-based learning and research in a program that prepares students to apply the sustainability perspective to their future endeavors.

The minor will provide an interdisciplinary approach to sustainability, allowing students to explore the challenges of sustainability and to think about how to develop solutions to pressing issues at the local, regional, and global scale. Students will be exposed to information and experiences that increase their knowledge base of the three pillars of sustainability as reflected in the human and scientific dimensions as well as coursework on ethics and policy. In addition, students will be able to articulate the integrated dimension of sustainability within an interdisciplinary setting.

5. Describe the workforce demand for graduates in related fields, including national demand and demand within South Dakota. *Provide data and examples; data sources may include but are not limited to the South Dakota Department of Labor, the US Bureau of Labor Statistics, Regental system dashboards, etc.*

Workers in nearly any career will benefit from this minor. Sustainability skills may be applied to a much larger range of the workforce. Employers across many sectors are seeking workers trained in systems-thinking and sustainability who can help them compete in a world of limited resources. According to the Bureau of Labor Statistics, although sustainability most often is associated with environmental protection and conservation, it also has social and economic impacts. In fact, many companies adopt sustainability strategies to increase profits, and the environmental aspects become an added bonus. Sustainability professionals help organizations achieve their goals by ensuring that their business practices are economically, socially, and environmentally sustainable. Sustainability is a diverse field that includes a wide variety of professionals. Sustainability professionals can be business managers, scientists, or engineers; or they can come from other backgrounds. Although their specific career paths might differ, sustainability professionals promote environmental protection, social responsibility, and profitability.¹

From January to March 2015, 1.2 million green job opportunities were posted across the United States.² Specifically, from 2014-2015, South Dakota saw a 137% increase in clean green jobs.³ According to May 2011 BLS figures, the highest median salaries in sustainability are in areas of management and engineering. Other specific sustainability work includes industrial managers, logistics (transportation, storage, and distribution) managers, environmental scientists, and civil engineers. The range of professions to which sustainability is relevant is considerable. Virtually any field that requires an understanding of the social, environmental and economic implications of personal, corporate and government decisions is applicable. These fields include but are not limited to researchers, advocacy experts, policy makers, urban planners and geographers, social workers, entrepreneurs interested in the green economy, energy auditors, and business process specialists, among others.

In addition, the *2020 Vision: The South Dakota Science and Innovation Strategy* plan includes Innovation in Energy and Environment (including renewable energy) as one of the state's target

¹ Bureau of Labor Statistics, U.S. Department of Labor, *Is a Sustainability Career on Your Green Horizon?*, <https://www.bls.gov/green/sustainability/sustainability.pdf>

² <https://www.ecotechinstitute.com/>

³ <https://www.ecotechinstitute.com/cleanjobsindex/infographics/clean-jobs-infographic-2015-q3.png>

sectors.⁴

The proposed minor does not by itself qualify a student for employment in these fields; however, the Bureau of Labor Statistics employment projections include a number of potential careers relevant to the Sustainability minor. For example, from 2016-2026⁵:

- Cartographers and photogrammetrists projected to grow 19%, much faster than average.
- Civil engineers projected to grow 11%, faster than average.
- Conservation scientists and foresters projected to grow 6%, as fast as average.
- Construction managers projected to grow 11%, faster than average.
- Environmental engineers projected to grow 8%, as fast as average.
- Environmental scientists and specialists projected to grow 11%, faster than average.
- Geographers projected to grow 6%, as fast as average.
- Landscape architects projected to grow 6%, as fast as average.
- Logisticians projected to grow 7%, as fast as average.
- Management analysts projected to grow 12%, faster than average.
- Mechanical engineers projected to grow 9%, as fast as average.
- Natural Science Managers projected to grow 10%, faster than average.
- Occupational health and safety specialists and technicians projected to grow 8%, as faster as average.
- Operations research analysts projected to grow 27%, much faster than average.
- Social and community service managers projected to grow 16%, faster than average.
- Urban and regional planners projected to grow 13%, faster than average.

6. Provide estimated enrollments and completions in the table below and explain the methodology used in developing the estimates.

The estimates below were developed based on past enrollment figures in new minors and their four-year progression, along with discussions with faculty and administrators regarding interest in the proposed minor.

	Fiscal Years*			
	1 st	2 nd	3 rd	4 th
<i>Estimates</i>	FY 18	FY 19	FY 20	FY 21
Students enrolled in the minor (fall)	15	25	35	45
Completions by graduates	0	5	15	20

*Do not include current fiscal year.

7. What is the rationale for the curriculum? Demonstrate/provide evidence that the curriculum is consistent with current national standards.

The curriculum will provide students with an interdisciplinary approach to sustainability, allowing students to explore the challenges of sustainability and to think about how to develop solutions to pressing issues at the local, regional, and global scale. Students will be exposed to information and experiences that increase their knowledge base of the three pillars of sustainability as reflected in the human and scientific dimensions as well as coursework on ethics and policy. All students will be required to complete a core set of courses (9 credits) which address an overview of

⁴ SD EPSCoR REACH Committee (2013) 2020 Vision: The South Dakota Science and Innovation Strategy. Available at <http://sdepscor.org/sdepscorHome/wp-content/uploads/2015/07/2020-Vision.pdf>.

⁵ Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, on the Internet at <https://www.bls.gov/ooh/> (visited November 01, 2017).

sustainability. In addition, students will select one course from three different emphasis areas: 1) Human Dimensions, 2) Scientific Dimensions, and 3) Ethics, Law, Policy and Planning. The result is a curriculum that introduces students to the field of sustainability, then provides knowledge, concepts, and practices that support professional activity and/or further education in sustainability. This curriculum was developed through an interdisciplinary collaboration between the Departments of Consumer Sciences, Geography, Natural Resource Management, Chemistry & Biochemistry, and Health Sciences.

8. Complete the tables below. Explain any exceptions to Board policy requested.

A. Distribution of Credit Hours

Minor in Sustainability	Credit Hours	Percent
Requirements in minor	9	50%
Electives in minor	9	50%
Total	18	100%

B. Required Courses in the Minor

Prefix	Number	Course Title	Credit Hours	New (yes, no)	Discipline/Prefix Fee ⁶
GEOG	102	Sustainable Society	3	Yes	\$20.15
Select <u>1</u> of the following courses:					
NUTR	111	Food, People and the Environment	3	No	\$28.20
NRM	110	Introduction to Natural Resource Management	3	No	\$20.15
SOC	245	Environment and Society	3	No	N/A
Select <u>1</u> of the following courses:					
ABS	475-475L	Integrated Natural Resource Management and Lab	3	No	\$20.15
GEOG	447	Geography of the Future	3	No	\$20.15
Subtotal			9		

9. Elective Courses in the Minor: List courses available as electives in the program. Indicate any proposed new courses added specifically for the minor.

Students must complete at least 9 credits from the following. Select 1 course from each category.

Prefix	Number	Course Title	Credit Hours	New (yes, no)	Discipline/Prefix Fee
Human Dimensions					
Select <u>1</u> of the following courses:					
ABS	203	Global Food Systems	3	No	\$20.15
ECON	372	Introduction to Resource and Environmental Economics	3	No	\$28.85
ENGL	256	Literature of the American West	3	No	N/A
GEOG	415	Environmental Geography	3	No	\$20.15
HIST	379	Environmental History	3	No	N/A

⁶ https://www.sdbor.edu/administrative-offices/academics/academic-affairs-guidelines/Documents/1_Guidelines/1_10A_Guideline.pdf

MKTG	370	Marketing	3	No	N/A
PSYC	244	Environmental Psychology	3	No	N/A
SOC	462	Population Studies	3	No	N/A
WL	430-430L	Human Dimensions in Natural Resource Management and Lab	3	No	\$20.15
Scientific Dimensions					
Select <u>1</u> of the following courses:					
CEE	225	Principles of Environmental Science and Engineering	3	No	\$80.55
CM	460	Sustainable Building Systems Concepts and Analysis	3	No	\$80.55
EES	275	Introduction to Environmental Science	3	No	\$20.15
GEOG	425	Population Geography	3	No	\$20.15
HO/PS	447	Organic Plant Production	3	No	\$20.15
NRM	221	Introduction to Conservation Planning and Management	3	No	\$20.15
NRM	311	Principles of Ecology	3	No	\$20.15
RANG	205-205L	Introduction to Range Management and Lab	3	No	\$44.65
WL	220	Introduction to Wildlife and Fisheries Management	3	No	\$20.15
Ethics, Law, Policy and Planning					
Select <u>1</u> of the following courses:					
AGEC	479	Agricultural Policy	3	No	\$28.85
GEOG	365	Land Use Planning	3	No	\$20.15
NRM	300	Laws and Policies in Natural Resource Management	3	No	\$20.15
PHIL	454	Environmental Ethics	3	No	N/A

Note: Several elective courses have prerequisites, meaning that students may take more than the 18 credit hours prescribed in AAC Guideline 2.8 for a minor. However, the prerequisites in question are typically taken during students' general education coursework, thus will have little effect on students pursuing the minor. A list of such courses and the prerequisites is below:

- ENGL 256 (ENGL 201)
- MKTG 370 (ECON 201 or 202)
- PSYC 244 (PSYC 101 or 102)
- SOC 462 (SOC 100 or 150)
- CEE 225 (CHEM 106 or 114)
- EES 275 (CHEM 106 or 112)
- AGEC 479 (ECON 201+202)

10. What are the learning outcomes expected for all students who complete the minor? How will students achieve these outcomes?

Students who complete the requirements for the Sustainability minor will be able to:

1. Define sustainability and articulate an understanding of the linkages between social, economic, and environmental perspectives.
2. Recognize and assess how sustainability impacts the natural environment and human

communities.

- Apply measures of sustainability and an evidence-based, interdisciplinary approach to issues of social, environmental and economic justice.

The attached curriculum map (Appendix A) shows where students achieve these outcomes in the curriculum.

11. What instructional approaches and technologies will instructors use to teach courses in the minor? *This refers to the instructional technologies and approaches used to teach courses and NOT the technology applications and approaches expected of students.*

Standard instructional approaches will be used.

12. Delivery Location⁷

- A. Complete the following charts to indicate if the university seeks authorization to deliver the entire program on campus, at any off campus location (e.g., UC Sioux Falls, Capital University Center, Black Hills State University-Rapid City, etc.) or deliver the entire program through distance technology (e.g., as an online program)?**

	Yes/No	Intended Start Date
On campus	Yes	2018-2019 Academic Year

	Yes/No	If Yes, list location(s)	Intended Start Date
Off campus	No		

	Yes/No	If Yes, identify delivery methods ⁸	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		

- B. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the certificate through distance learning (e.g., as an online program)?⁹**

	Yes/No	If Yes, identify delivery methods	Intended Start Date
Distance Delivery (online/other distance delivery methods)	Yes	018 - Internet Synchronous	2018-2019 Academic Year

83% of the Sustainability minor is available online.

13. Does the University request any exceptions to any Board policy for this minor? Explain any requests for exceptions to Board Policy. If not requesting any exceptions, enter "None."

⁷ The accreditation requirements of the Higher Learning Commission (HLC) require Board approval for a university to offer programs off-campus and through distance delivery.

⁸ Delivery methods are defined in [AAC Guideline 5.5](#).

⁹ This question responds to HLC definitions for distance delivery.

None.

14. Cost, Budget, and Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, time redirected from other assignments, instructional technology & software, other operations and maintenance, facilities, etc., needed to implement the proposed minor. Address off-campus or distance delivery separately.

SDSU does not require any additional resources to offer this minor.

15. New Course Approval: New courses required to implement the new minor may receive approval in conjunction with program approval or receive approval separately. Please check the appropriate statement (place an "X" in the appropriate box).

- YES,
the university is seeking approval of new courses related to the proposed program in conjunction with program approval. All New Course Request forms are included as Appendix C and match those described in section 7.
- NO,
the university is not seeking approval of all new courses related to the proposed program in conjunction with program approval; the institution will submit new course approval requests separately or at a later date in accordance with Academic Affairs Guidelines.

Appendix A
Minor in Sustainability – Student Learning Outcomes

Individual Student Outcome	Program Courses that Address the Outcomes								
	ABS 475-475L	GEOG 102	GEOG 447	NRM 110	NUTR 111	SOC 245	Human Dimensions Electives	Scientific Dimensions Electives	Ethics, Law, Policy and Planning Elective
Students will define sustainability and articulate an understanding of the linkages between social, economic, and environmental perspectives.	X	X	X						
Students will recognize and assess how sustainability impacts the natural environment and human communities.	X	X	X	X	X	X		X	
Students will apply measures of sustainability and an evidence-based, interdisciplinary approach to issues of social, environmental and economic justice.	X	X	X	X		X	X		X